REMARKS

In the Office Action, dated March 21, 2008, the Examiner states that Claim 8 is pending and rejected. By the present Amendment, Applicant amends the claim.

1. Rejection of Claim 8 under 35 U.S.C. 103(a)

Claim 8 is rejected under 35 U.S.C. 103(a) as unpatentable over Takizawa et al. (US 6,834,861) in view of JP 3-41078 and Bush (US 3,893,660) for the reasons of record. Applicant respectfully disagrees with and traverses this rejection.

At the outset, Applicant has amended Claim 8. This amendment was made solely in the interest of advancing prosecution and without prejudice or disclaimer of the subject matter thereof. No new matter has been added.

Amended Claim 8 recites the width of the oil ring in the axial direction is in the range of 1.0 mm to 2.0 mm. Functions of oil rings such as reduction of lubricating oil consumption can be dramatically improved by improving the following capability. In order to improve the following capability, the width of the oil ring in the axial direction is within the range of 1.0 mm to 2.0 mm. As apparent in Fig. 8 of the instant application, the slope of the curve dramatically changes at the width 2.0 mm. Thus, the amended claim features the "critical point" of the width of the oil ring in the axial direction in the range of 1.0 mm to 2.0 mm.

Amended Claim 8 also recites a ratio of a thickness and a width of the cross sectional shape of the anomaly wire, which forms the coil expander, is in the range of 1:2 to 1:3.5. As seen in Table 1 and Fig. 9, the slope of the curve/line dramatically changes at the aspect ratio of 2.0. Thus, it was discovered by the present inventors that the "critical point" of the ratio of the thickness and the width of the anomaly wire is 1:2 to 1:3.5. Being within the range, the tension of the coil expander can be dramatically improved. By discovering this "critical point" the present invention makes it possible to use a coil expander formed of shape memory alloy, by which optimal tension can be expressed both at the start up of an engine and at a high rotation region, in combination with an oil ring having a width in the range of 1.0 mm to 2.0 mm exhibiting excellent following capacity.

In contrast to the rejected claim, Takizawa et al. does not teach or suggest the use of shape memory alloy for the coil expander. Moreover, Takizawa et al. does not teach or suggest a ratio of a thickness and a width of the cross sectional shape of the anomaly wire, which forms the coil expander, in the range of 1:2 to 1:3.5.

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Although Takizawa et al. discloses an oil ring having a width in the axial direction in a range of 1.2 mm to 2.0 mm, it is silent with respect to why it is employing such a range. As such, not only is Takizawa et al. missing at least two of the instant claim features (i.e. use of shape memory alloy for the coil expander and a ratio of 1:2 to 1:3.5), one of ordinary skill in the art would have no motivation in combining its oil ring with the other cited prior art because it is clearly not obvious that the disclosed range of 1.2 mm to 2.0 mm would dramatically improve the reduction of lubricating oil consumption or the following capability.

JP 3-41078 is also silent with respect to a ratio of a thickness and a width of the cross sectional shape of the anomaly wire, which forms the coil expander, in the range of 1:2 to 1:3.5. Further, JP 3-41078 does not teach or suggest using a coil expander formed of shape memory alloy in combination with a thin oil ring.

As such, even if these references were combined as suggested in the Office Action, they would fall short of yielding the claimed invention as they do not teach or suggest all of its features.

Bush discloses forming the outer ring-engaging surface of each coil of the spring into the same curvature as the inner surface of the piston ring in order to reduce or eliminate wear between the piston ring and the helical spring. Thus, the problem to be solved by Bush is completely different from that of the rejected claim. Although Bush may disclose a ratio of about 1:1, there is absolutely no description about the relationship between the cross-sectional shape of the wire and the tension in any of the cited references. As such, one of ordinary skill in the art would have no motivation or expectation of success in combining the wire ratio of Bush with the other cited prior art to achieve a larger tension value.

Accordingly, Applicant respectfully requests withdrawal of the rejection of Claim 8 under 35 U.S.C. 103(a).

2. Rejection of Claim 8 under 35 U.S.C. 103(a)

Claim 8 is also rejected under 35 U.S.C. 103(a) as obvious over Takizawa et al. in view of Masuyama et al. and Bush for the reasons of record. Applicant respectfully disagrees with and traverses this rejection.

As previously pointed out, in contrast to the rejected claim, Takizawa et al. does not teach or suggest the use of shape memory alloy for the coil expander. Moreover, neither Takizawa et al. nor Masuyama et al. teach or suggest a ratio of a

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thickness and a width of the cross sectional shape of the anomaly wire, which forms the coil expander, in the range of 1:2 to 1:3.5.

As such, even if these references were combined as suggested in the Office Action, they would fall short of yielding the claimed invention as they do not teach or suggest all of its features.

Moreover, as previously mentioned, although Bush may disclose a ratio of about 1:1, there is absolutely no description about the relationship between the cross-sectional shape of the wire and the tension in any of the cited references. As such, one of ordinary skill in the art would have no motivation or expectation of success in combining the wire ratio of Bush with the other cited prior art to achieve a larger tension value.

Accordingly, Applicant respectfully requests withdrawal of the rejection of Claim 8 under 35 U.S.C. 103(a).

In light of the foregoing response, all the outstanding objections and rejections are considered overcome. Applicant respectfully submits that this application should now be in condition for allowance and respectfully requests favorable consideration.

Respectfully submitted,

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